Project Overview

Combi Informatics System

Alamgir Karim

Planning & Implementation:

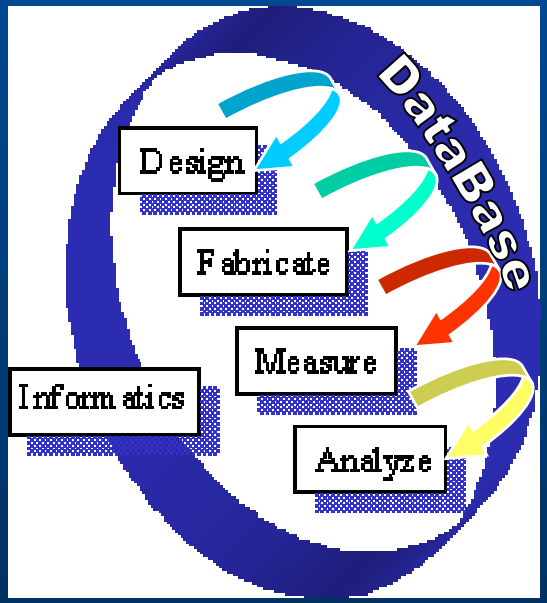
Polymers Division: Wenhua Zhang, Mike Fasolka, Amit Sehgal, Eric J. Amis

CTCMS: Andy Roosen, James Warren

Project Goal – Closing the Loop

Informatics & feedback for:

- Data management, integration
- Data visualization
- Automated data entry, retrieval
- Protocols for standardized data formats
- Link to and refine other Combi processes formats
- Library of scientific combi-data



Progress

- Database system selection
- Database server setup
- Security / data protection issues
- Basic framework of the database
- Backbone interface programming

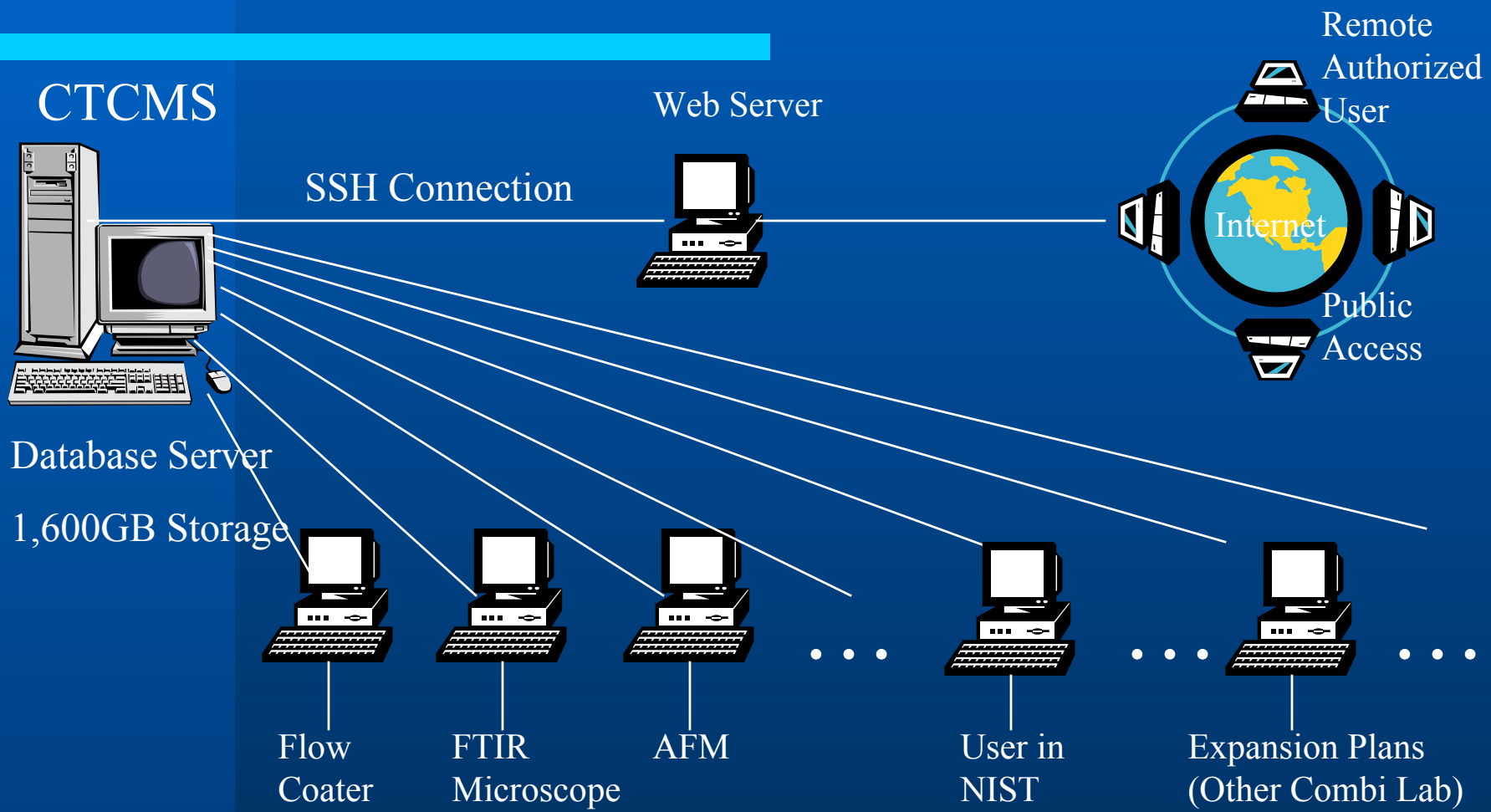
PostgreSQL

- Sophisticated Object-Relational DBMS
- Supporting almost all SQL (Structured Query Language), including subselects, transactions, and user-defined types and functions
- One of the most advanced open-source database available anywhere
- Commercial support available

FOR MORE INFO...

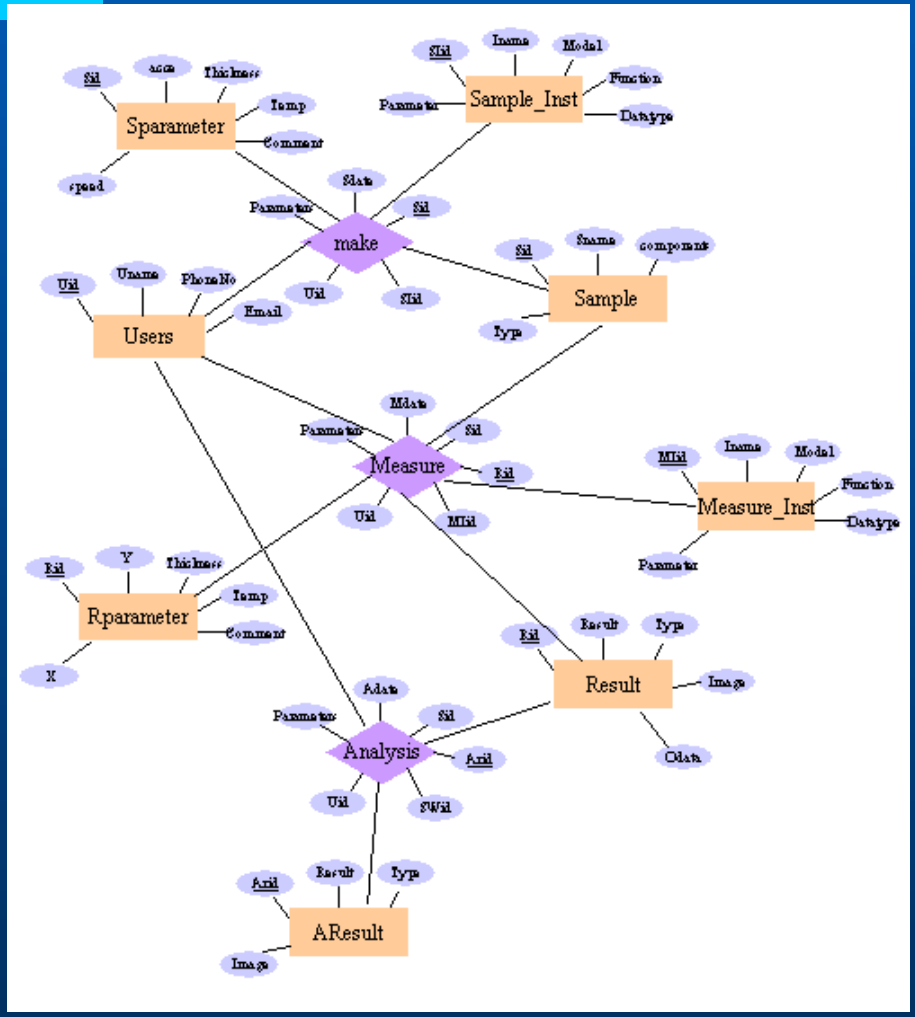
WWW.POSTGRESQL.ORG

Combi Informatics System



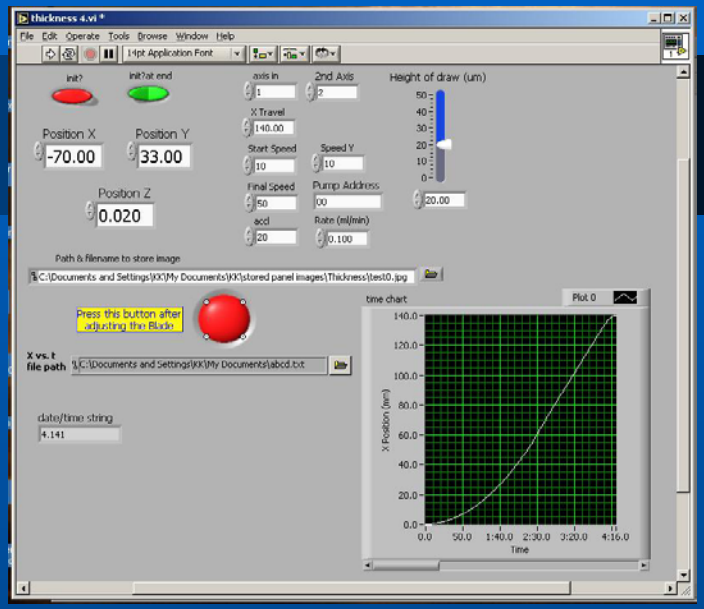
Basic Structure of Database

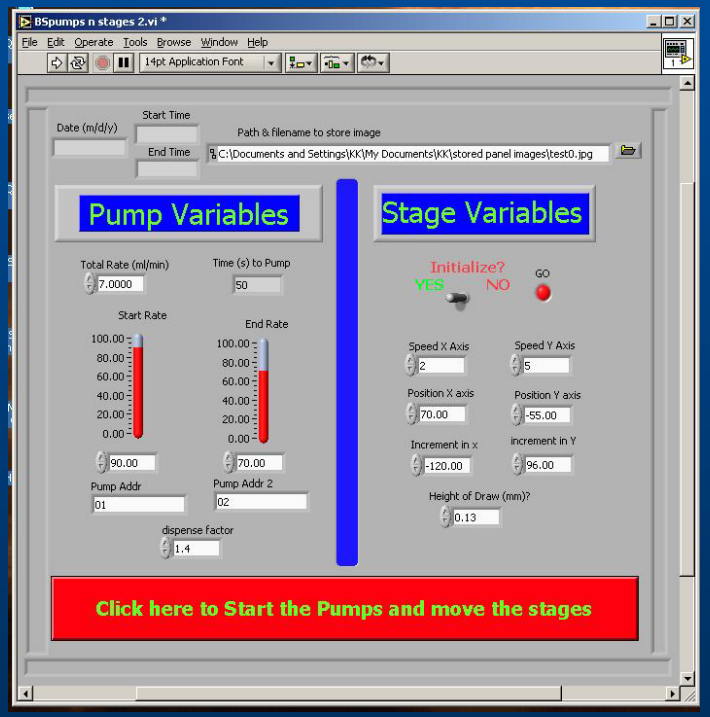
- Straight forward structure in consideration of automation & expansion
- Must reflect the frame-work of the Combi lab
- Establish basic protocol of Combi experiment set (All stages of Combi processes)
- Large objects, such as image, video, result chart, original data file storage

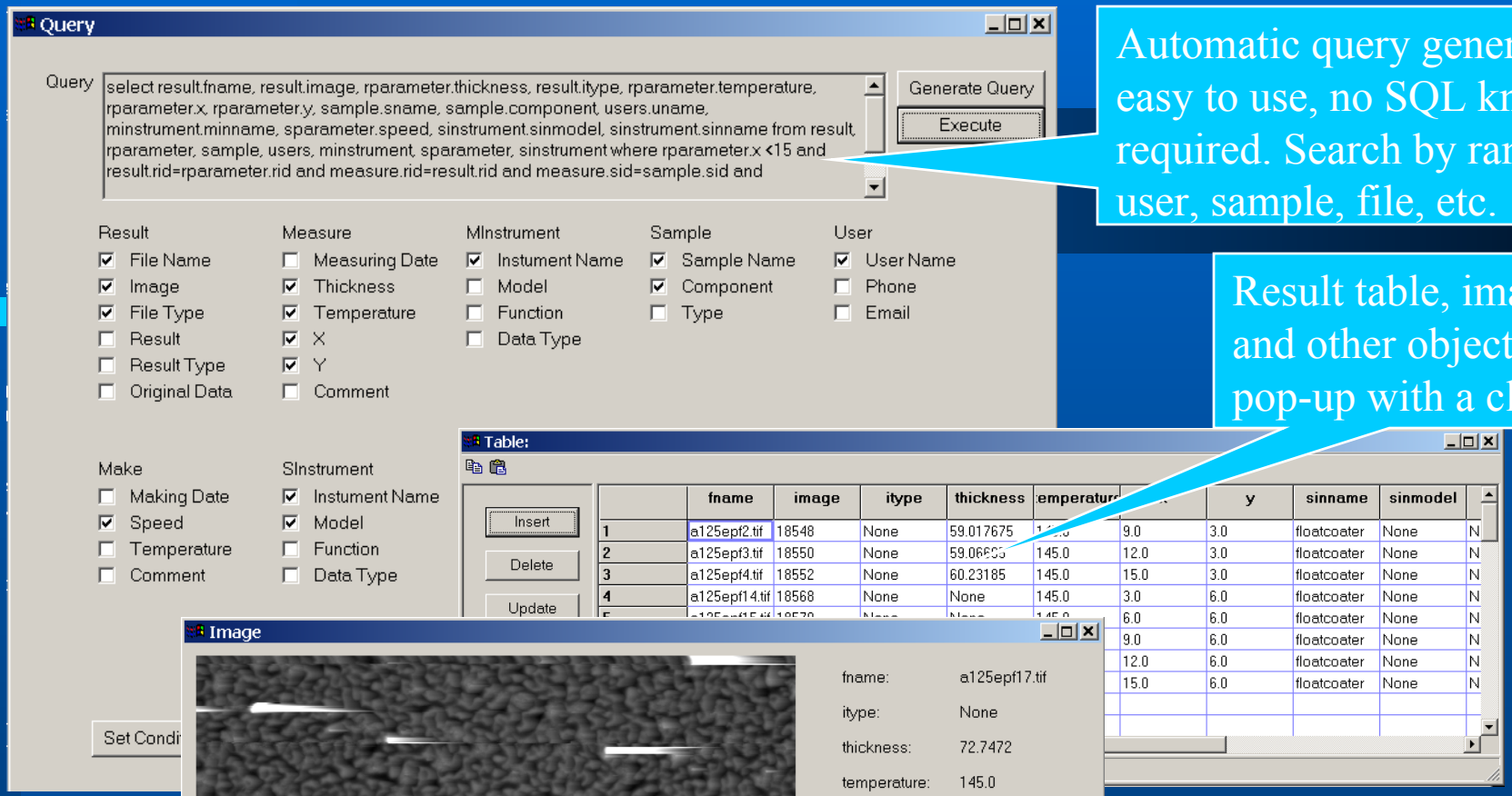


Instrument Interface Programming

- Instrument E-notebook
- Straight forward, use friendly
- User specific access levels







Automatic query generation easy to use, no SQL knowledge required. Search by range, type, user, sample, file, etc.

Result table, image and other objects can pop-up with a click

Data Mining

Image object with its conditions shows up on user's desktop almost instantaneously

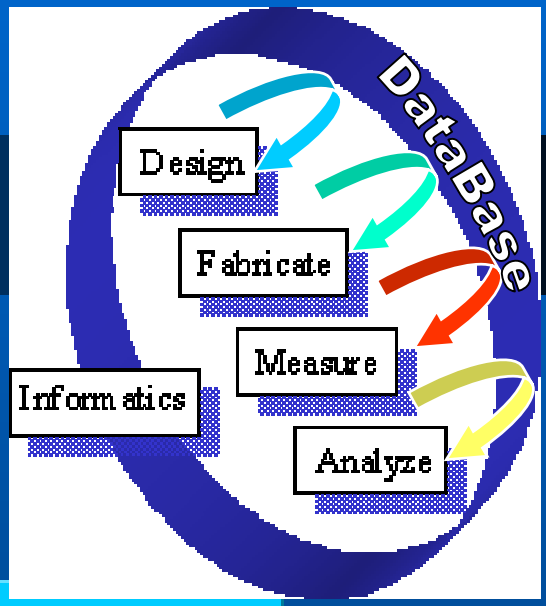
Software Technology

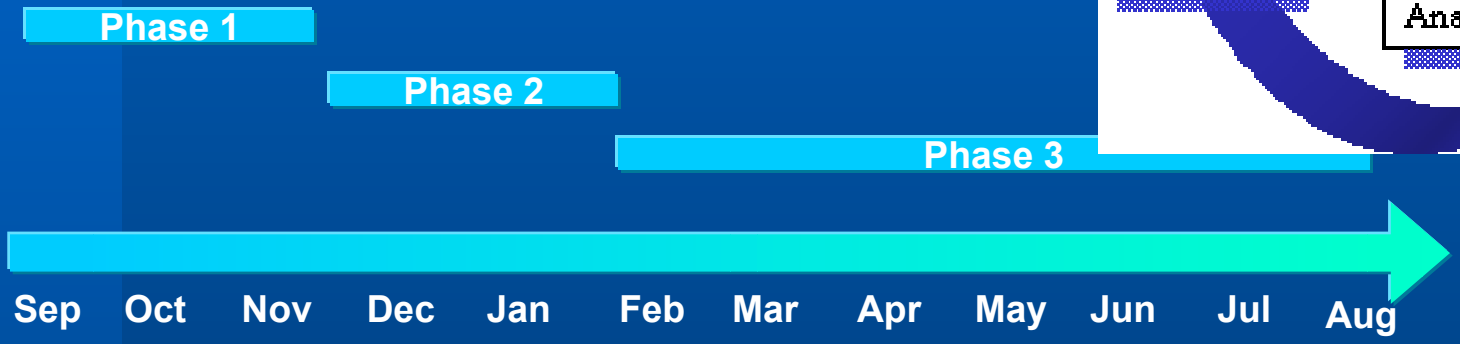
- Programming Language
  - Python (Open source, Object oriented)
- Secured Shell Connection with the Database server
- ZOPE selected as Web server
  - Base on Python, Open source, Easy to maintain, Database connectivity
- Integration with current data analysis software (mostly IDL)
- Consideration of future interface with other softwares

Team/Resources (In planning stage)

- **Current Team and Resources**
  - **Workforce:**
    - **Wenhua Zhang, Mike Fasolka, Amit Seghal, Kapel Kapeelashwar, Alamgir Karim, Eric Amis**
    - **Andy Roosen, James Warren**
  - **Equipment:**
    - **Presently identified: Polymer Combi Lab instrument, database server in CTCMS**
  - **Locations**
  - **Support & outside services**

1-Year Schedule





Phase 1: Database setup and programming, e-notebook

Phase 2: Machine programming and automatic data entry and retrieval

Phase 3: Analytic software and feedback automation